Chapter **6**

Police Department

Information Systems Technology Enhancement Project

ISTEP

Case Study: Charlotte–Mecklenburg, North Carolina

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Charlotte-Mecklenburg Highlights

The Charlotte-Mecklenburg Police Department is a countywide police agency serving Mecklenburg County, North Carolina, one of the fastest growing counties in the United States. Prior to 1993, both the county and the city of Charlotte had independent police agencies. On October 1, 1993 the two police agencies were merged, and for the past five years the integration of both forces has been ongoing.

During the merge, command staff restructured administration and operations around what the department has defined "community-problem oriented policing" (CPOP). The Community Safety Plan, a document that outlined the general model for reform within the department, was developed to set the overall direction of this new organization and the implementation of CPOP. Today, the department is one of the most respected community policing agencies in the country.

Charlotte-Mecklenburg has impressive technology emerging to support CPOP. The Knowledge-Based Community Oriented Policing System, or KB-COPS, will be among other things, an information system that stores problems and their resolutions, as well as a system to prompt police officers in the field as to how they might pursue future responses. The Future Alert and Contact Network (FALCON) allows officers to link multiple databases, identify a set of events or conditions that would "trigger" information, and then act on the information provided. Once a designated condition or event has occurred, the FALCON system will automatically notify the officer of the situation either by e-mail or by pager. The department sees such a system as making the problem identification and resolution function, which is at the heart of any community policing effort, more proactive.

These unique information systems were not created by accident. Considerable vision and intense planning was involved in the department's development of top-notch technology. The Master Information System Plan, published in 1996, set the stage for technology development. This plan was developed with the assistance of a technology consultant from a local university with expertise in public sector information resource management. To develop the plan, the department conducted an in-depth information needs assessment of end users. To carry out the plan, however, the department assembled a strong team of experienced and dedicated technical and management personnel to turn the vision into a reality.

The department has also keenly managed the high risks associated with public sector information system acquisition and implementation. They developed an aggressive technology contract strategy and hired an attorney to draft and review all city technology contracts. This strategy has sought to decrease ambiguity in vendor contracts and place the city in a position to demand the contract detail and specifications necessary to make technology projects successful.

1 Purpose and Scope of Report

This case study is one of several produced for the Information Systems Technology Enhancement Project (ISTEP), a project funded by the Office of Community Oriented Policing Services. The aim of ISTEP is to increase the use of information and information technology in police departments, particularly regarding the implementation of community policing. The case studies document the current state of information technology and the use of information in five police departments: Tempe Arizona; San Diego, California; Hartford, Connecticut; Reno, Nevada; and Charlotte-Mecklenburg, North Carolina. These case studies are based on a limited review of the status of information technology in the departments. A separate cross-site report synthesizes the findings of the individual case studies. A report on the project's conceptual framework presents the overall ISTEP approach and discusses how community policing demands different types of information systems, analysis methods, and uses of information than those required under the professional-era model of policing.

This case study is based on information collected through interviews with key organizational personnel, a review of planning and technology documents and other information supplied by the Charlotte-Mecklenburg Police Department, and ride-alongs with police personnel in several patrol areas throughout Charlotte. Additional information about the department and the Charlotte-Mecklenburg region was obtained from the Internet and the Web sites of both the Charlotte-Mecklenburg Police Department and city/county government.

This report is based, in part, on three site visits to the Charlotte-Mecklenburg Police Department conducted by members of the ISTEP team. The first visit occurred on March 2-3, 1998, and focused primarily on interviews with the chief of the Charlotte-Mecklenburg Police Department and a technology consultant to the police department working on the design and implementation of a technology plan for the department. These interviews focused on understanding technology development and gaining a better understanding of the organization and administration of the Charlotte-Mecklenburg Police Department. The technology consultant is responsible for the design of the technology plan the department is pursuing, and the chief is the central figure in the reengineering of the police department and its adoption of a form of community- and problem-oriented policing (CPOP).

The second site visit to Charlotte took place July 13-15, 1998, when additional information about the department's pursuit of its technology plan was acquired and field work was conducted to better understand Charlotte's version of community-oriented policing. During this visit the research team spent time in the field in the "David" Patrol Division, a patrol area that abuts the downtown portion of the City of Charlotte.

The third and final visit to Charlotte occurred October 19-21, 1998, when most of the effort focused on understanding field operations and the decentralized form of management and operations the Charlotte-Mecklenburg Police Department has been attempting to adopt. Follow-up information on technology development and some of the training associated with technology was also pursued during this site visit. In par-

ticular, this visit included an interview with persons in the city's Information Technology Services (ITS) to explore the linkage between the police department's pursuit of technology and the efforts of the city and county to support and promote integrated technology use. During this visit, time was also spent with a major, who oversees technology development and links these efforts to the line operations of the department.

The organization of this case study document follows the overall conceptual framework for the ISTEP project. Accordingly, after providing background information on the police department in Section 2, particularly with respect to implementation of community policing, the case study describes current and planned information systems (Section 3), analysis methods (Section 4), and uses of information (Section 5). Section 6 summarizes our findings.

2 Police Department Background

2.1 Size, Overall Organization, Crime Levels, and Trends

The Charlotte-Mecklenburg Police Department is a countywide police agency serving Mecklenburg County, North Carolina, one of the fastest growing counties in the United States. In 1980 the Charlotte-Mecklenburg area had an estimated population of approximately 720,000 persons. By 1998 the Charlotte-Gastonia-Rock Hill Metropolitan Statistical Area (MSA) had an estimated population in excess of 1.3 million people. Located near the border separating North and South Carolina, Charlotte and Mecklenburg County are in the center of the country's sixth largest urban region, with nearly 6 million people living within a 100-mile radius of Charlotte. In 1998 Mecklenburg County had 245,200 households with a median household income of $41,461. The past 10 years of economic growth in this area has been accompanied by a $3.7 billion growth associated with new businesses. Charlotte is fast becoming a major regional banking center, with Bank of America (Nations Bank) and First Union Corporation being among the largest employers in the region. In addition, US Airways and several regional and national health care providers have anchored in Charlotte. In 1997 the Charlotte-Mecklenburg area had an unemployment rate of 2.6 percent, well below that of the State and the nation.

Prior to 1993, the county and the city of Charlotte each had an independent police agency. The county operated primarily in the rural parts of Mecklenburg County, while the city police department operated as a larger, urban-focused police agency. On October 1, 1993, the two police agencies merged, and for the past five years the integration of the two forces has been ongoing. At the same time, the police department has been restructuring administration and operations around community- and problem-oriented policing concepts. Because the two previous police agencies (county and city) had developed different cultures and styles, there has been a considerable struggle to fit these two agencies together.

In 1994 a new chief of police was selected and appointed Chief of Police over the Charlotte-Mecklenburg Police Department, and since that time he has been involved in integrating and upgrading the two forces into one police department. Currently,

there are approximately 1,300 police officers in this agency, and an increase to about 1,500 sworn personnel has been authorized. Prior to the new chief's arrival, the department was described as very traditional, with a somewhat small-town focus. This is consistent with the county and city's experience with growth. As previously indicated, about 20 years ago the Charlotte area was a small town in central North Carolina. Several banks and their attendant service industries have relocated to Charlotte and growth in the area has been significant. This is both a problem and a boon for the police department. On the downside, the area has grown so rapidly that simply keeping up with the growth is a major task. On the upside, the growth has been accompanied by increasing revenue and support for local agencies, especially the police department. The chief has managed to link local spending for police services with a wide array of external funding, including considerable funding from the Office of Community Oriented Policing Services (COPS) and the National Institute of Justice (NIJ). These funding streams have converged to help support both technological development and the expansion of community- and problem-oriented policing in Charlotte.

Since 1994 the department has witnessed a significant amount of change, including, but not limited to, the building of a new central police facility, the redistricting of service areas and districts to better align them with "natural" communities, and the introduction of a form of community policing that stresses decentralized decision making and accountability and the "empowerment" of local commanders and police officers to solve and address local community crime and disorder problems. Also occurring during this time was the planning, design, and implementation of a rather complex technology plan. Many of those interviewed were genuinely excited by all of the changes they have seen in the period between 1994 and the present, while at the same time many suggested that "this chief never sleeps."

The county is divided into four service areas (Adam, Baker, Charlie, and David). Each service area is subdivided into three smaller districts. Districts are then subdivided into response areas. A deputy chief heads each service area, while a captain heads each district. The department's rank structure has only five levels of management and does not include the rank of lieutenant. In addition to the four deputy chiefs assigned to the department's four service areas, there is a deputy chief assigned to the Investigations Division and a deputy chief assigned to administration, overseeing such functions as budgeting, training, and support services.

Since coming to Charlotte, the chief has emphasized a decentralized style of management, giving considerable autonomy to each service area and district. Wrapped in the cloak of community- and problem-oriented policing, the department seeks to build partnerships, open communications, and address a wide range of crime, order, and quality-of-life issues in neighborhoods.

The organizational structure and process of decentralized decision making within the Charlotte-Mecklenburg Police Department, while interesting, is also a significant complicating factor in the implementation of both CPOP and the technology envisioned by the department. All interviewed have extremely high expectations for the technology

once it is fully operational. In many respects they expect the technology to help routinize departmental functioning, while at the same time enabling a wide array of information to be brought to bear on tactical decision making and operations.

The Charlotte-Mecklenburg Police Department received 707,542 E-911 calls for service in 1998. The department responded to 517,375 calls by dispatching an officer to the scene or by taking a telephone report. The remaining calls were transferred to Fire or Medic. Between 1997 and 1998 the city and county experienced a decline in most Part 1 violent crimes. Overall, violent crime declined by 8.5 percent between 1997 and 1998, with reported rapes down 6.5 percent, robberies falling by 17.4 percent, and aggravated assaults declining by 5.1 percent. Property crime in Charlotte-Mecklenburg County increased by 1.2 percent between 1997 and 1998, although in 1998 arson, auto theft, and residential burglary were below those reported in 1997.

2.2 Community-Oriented Policing Background

The department has been going through a significant transformation process that began in 1993 and continues to the present. The various levels of change within the department are, or should be, producing a need for better and more timely information at both the administrative and operational levels. More importantly, the changes within the department are seen as furthering the adoption of CPOP, the particular mix of community- and problem-oriented policing being implemented in Charlotte. This style of policing has several distinct elements in the Charlotte-Mecklenburg Police Department.

Decentralization of the department has resulted in area commanders (deputy chiefs, majors, and captains) being tasked with improving the quality of life and safety of the residents and businesses in those respective areas. The department is attempting to shift to a results-oriented system of productivity review: the chief continues to stress that area commanders should be responsive to community needs, including crime, while at the same time being creative in solving local problems. Some interviewed are concerned that the decentralization of the department effectively creates four (five, including the central headquarters) police departments in Charlotte. This is in fact the case, where police service areas and indeed districts appear to be in competition with one another as to the style of policing they will adopt. In the long term these distinctions will be important across the organization. Basically, they center on whether community policing will be a generalist or specialist function within the respective service areas and districts. Initially, community coordinators were created in all of the service areas and districts to start the process of focusing on CPOP within the department. Certain service areas, such as the David Service Area, would like to continue the specialist model, while others, like the Charlie Service Area, focus on broadening responsibility for CPOP throughout the patrol force. In fact, much of the technology that is being implemented in the Charlotte-Mecklenburg Police Department is likely to require more line officer involvement in CPOP efforts.

Many interviewed anticipate that the technology will help in coordinating and integrating activities and initiatives across the four service areas and twelve districts. One

of the initial applications planned for the department is e-mail capability, to better link command personnel with central headquarters as well as with one another. The department does have biweekly meetings of command personnel to review plans, make necessary adjustments, and to discuss crime and problem-solving activities. In one interview it was indicated that the command staff is slowly coming around to a process of accountability and responsibility for being "on top" of local problems and issues. Most thought that information technology, including a new records management system (RMS), would greatly assist this process. At the two command meetings attended, however, it was clear that there is considerable variation in command officer understanding of and facility with CPOP activities. Moreover, it was clear in several interviews that there is still considerable internal discussion about the direction of the department and its adoption of CPOP strategies. Part of the struggle, no doubt, has been associated with the integration of two rather dissimilar police agencies that began in 1993 and continues today. Vestiges of both of the older policing systems continue to slow or otherwise alter the adoption of the proposed CPOP strategies in the Charlotte-Mecklenburg Police Department.

At the operational level, the department has created processes to increase police officer and field demands for better information. In Charlotte, police officers are permanently assigned to their response areas, and the stability of these assignments was stated to be quite high. All of the department's police officers and field managers (i.e., sergeants), as well as communications personnel (i.e., dispatchers and telecommunications specialists) have also received CPOP training (described below) following the four-step SARA model (scanning, analysis, response, and assessment). Field forces are now tasked with identifying problems and then resolving them. This typically takes the form of police officers identifying problems, and then asking their sergeants for the necessary time (off the radio) to resolve the problem. This problem-solving process has itself gone through several transformations within the department. There is also an effort afoot in the department to support CPOP interventions and decision making with information systems that are "smart" in that they provide information on how problems might be addressed, triggering decision making by officers and administrators. KB-COPS (Knowledge-Based Community-Oriented Policing System) is, among other things, an information system that will store problems and their resolutions, as well as prompt police officers in the field as to how they might pursue problem analysis and resolution. FALCON (Future Alert and Contact Network) allows officers to link multiple databases, identify a set of events or conditions that would trigger information, and then act on the information provided. Once a designated condition or event has occurred, the FALCON system will automatically notify the officer of the situation either by e-mail or pager. The department sees such a system as making the problem identification and resolution function, which is at the heart of any community policing effort, more proactive. The sooner that an officer can identify a crime pattern, links between cases, or a neighborhood disorder problem that may be the root cause of crime, the more likely that it can be solved before it has significant negative impact on a neighborhood.

Some of this experimentation with using technology to assist decision making is also occurring within selected service areas. For example, in the Adam Service Area a com-

puter program building a problem-solving database has been created. There is considerable excitement in that service area that such a database will be useful to all of the department's line personnel once the radio and telecommunications/data systems are fully operational. Currently, community coordinators in the Adam Area work on problem solving and log the results of these efforts into this system. Over time, it is anticipated that the results of such input will point to methods for problem resolution that are specific to particular types of crime and disorder problems.

As previously indicated, CPOP was initially a specialist function within districts. Community coordinators were identified as the point of contact between the department and the community in each district. These persons typically had little responsibility for radio assignments, freeing their time for community policing activities. The specialization of CPOP has drawn fire in the department, separating out radio response officers from these community coordinators. In some of the districts, captains have eliminated these positions in favor of a more generalized approach to CPOP. In other districts this has yet to happen. The implementation of CPOP across districts is currently uneven, and often linked to the personality, experience, and "buy-in" of the district captain. Furthermore, it was indicated that the level of CPOP within districts also often varied by shifts, with some shifts (typically the day shift) more closely associated with CPOP and the night and evening shifts perhaps less attached to these ideas. Nonetheless, the training of all personnel in problem solving and the migration of this style of policing throughout the Charlotte-Mecklenburg Police Department have created demands for useful and timely information.

2.3 Extent of Departmental Efforts in Community Policing

Solicitation of Citizen Input

The Charlotte city government and Mecklenburg county government appear to emphasize citizen involvement and obtaining feedback on government services. They have a website and enumerate several ways for citizens to get involved with government functions and specific departments. This orientation obviously affects the police department and its operations as well.

Within service areas there is considerable citizen involvement and attachment. The community coordinators are expected to service community concerns either directly or through some coordination of line officer activities in the affected districts. Service areas and districts also handle considerable walk-in traffic, wherein local residents and businesses contact community coordinators directly. Invariably this process also involves attendance at community meetings, as well as surveying residents and businesses concerning crime and disorder problems. Crime information for each service area and district is made available via the Internet, and the department has gone to considerable lengths to get information out to its many constituents.

To better understand community attitudes and expectations of the Charlotte-Mecklenburg Police Department, a telephone survey of a random sample of 858

households was conducted between April and May of 1995. This information provided a good assessment of community expectations about the police as well as the level of satisfaction the community had with the amount and scope of police services being provided. This information was collected as part of the Community Safety Plan, a document that outlined the general model for reform of the Charlotte-Mecklenburg Police Department (described below). The survey information continues to influence departmental decision making. Data from the survey were also analyzed for the uptown area of Charlotte. Here the focus was on feelings of safety. These types of activities suggest that the department has a program to actively encourage citizen participation and input into the department's activities and decisions.

Another illustration of community involvement is Charlotte's Citizen's Training Academy that was implemented in September 1994. This mini-police academy is designed to familiarize the community with police work and the policies and practices of the Charlotte-Mecklenburg Police Department. Forty-nine hours of instruction are provided to interested citizens who attend the academy. The department also has a Citizen's Review Board, a civic body that reviews police practices and behavior.

Geographic Focus

The Charlotte-Mecklenburg Police Department has a considerable investment in programs, systems, and technology emphasizing a geographic focus. Currently the department uses ArcView for its geographic information system (GIS) software. The capability of the GIS was initially limited by the current CAD system, which was said to have too few categories for meaningful analysis. This problem has been resolved with the acquisition of a new CAD system, planned for installation in mid to late 2000.

Crime analysis is provided systematically throughout the department, although it is not clear how much of the information is actually used as a support for problem solving tactically. It should be noted that this is an organization in transition and, while many of the "buzzwords" might be in place, it remains to be seen if this technology is being systematically used in the field. It is clear, however, that crime analysis is used to assist the chief in keeping area and district commanders informed and accountable for the level of crime and disorder in their respective areas. Moreover, it was clear that crime analysis and the use of geographically based information is likely to become the centerpiece of patrol functioning in the Charlotte-Mecklenburg Police Department in the years to come. The central question is not whether this is to happen, but how, and at what rate of implementation. Currently, crime analysts are assigned responsibility for area and district commands, increasing the likelihood that they will become familiar with local needs and capable of delivering information that will be useful locally.

The Strategic Planning and Analysis Bureau oversees the analytic functions in the department and provides support in the field for GIS applications. GIS applications are used to support CPOP in several ways. First, they serve as automated pin mapping systems that identify locations of crimes, arrests, drug complaints, and a wide range of other problems for which citizens mobilize the police. This information is displayed

on maps for the field forces; and citizens can download crime patterns for their police districts from the department's website. Second, GIS applications are used to identify crime "hot spots" by stacking calls for service and crime in particular locations.

One interesting application of this process was conducted in the Grier Heights Project using police data from January and February of 1995. The Grier Heights Project established a model for hot spot analysis in the Charlotte-Mecklenburg Police Department. The project integrated land use maps and calls-for-service data. This project is seen as a way to model problem solving throughout the city and county, and it is anticipated that this type of analysis will ultimately be used through laptop telecommunications linkages within patrol cars deployed through the city and county.

Finally, the Charlotte-Mecklenburg Police Department has formed a partnership with the Environmental Systems Research Institute (ESRI), the National Center for Geographic Information Analysis at SUNY Buffalo, and the City of Salinas Police Department. This partnership is meant to further test and develop GIS applications in a police environment, particularly in police agencies emphasizing community-oriented policing.

Emphasis on Prevention

The Charlotte-Mecklenburg Police Department, while still primarily a response-driven police department, has begun to shift operations and functions toward prevention as opposed to interdiction. The department has active crime prevention units as well as domestic violence units that are considerably focused on crime prevention. Moreover, the use of community coordinators in service areas and districts focuses attention on crime prevention and communication between the department and its communities. The department has a website that provides a substantial amount of information about preventing crime, and by all accounts "preventing the next crime" is a theme that the chief is attempting to drive into the organization.

It appears that there is considerable time available for community coordinators and indeed, patrol officers, to engage in crime prevention activities. Moreover, it appears that the department encourages this, and as officers become more involved in problem solving, they will, of necessity, need and use more crime prevention information. Finally, the information systems being developed and implemented will also include crime prevention information. For example, it is anticipated that the KB-COPS system will lead the police officer through the information requirements for completing problem analysis and investigating criminal events. At the same time, the system will provide the officer with relevant crime prevention information.

Emphasis on Partnerships

In several interviews it was stated that much of the impetus for CPOP came from the former city manager, who announced that the department would indeed pursue these ideas. He was also instrumental in merging the two police agencies, and has created a climate of interaction among city agencies that can be described as focused on neighborhood service delivery. The commitment to CPOP has continued with the new

city manager. It was also stated that relationships among city agencies in Charlotte were historically good owing to the small-town mentality of the city and the social and political culture that had grown up in the city over the years. These commitments, patterns of historic interaction, and a supporting political culture were described as helping to "push" the department down the CPOP path, while the department internally was also "pulling" the city into a community-government service delivery pattern. In essence, the circumstances in Charlotte seem rather supportive (internally and externally) of the introduction of a significant technology development plan in the police department as well as of the spread of community-oriented government in the city and county.

At the operational level, a considerable number of local partnerships have been formed. In the Adam Service Area, several city and county services are actually on-site in what could be called a mini-city hall, or one-stop service delivery center. Paying water bills, speaking with streets and recreational department personnel, talking with case workers from social services, and interacting with the police can all occur in one location. This station was seen as a model for the city; others have yet to be built, however, in the remaining service areas. Nonetheless, it is clear that the city and county governments stress partnerships, most particularly the city government. During several interviews it was obvious that command and operational personnel are well linked to other agencies and have regular communication with them.

Problem-Solving Orientation

While there is considerable evidence that the Charlotte-Mecklenburg Police Department has made significant strides in pursuing problem solving, it is not clear that such efforts have, to any great extent, permeated the police department as a whole, most particularly the patrol function. This is not a function of lack of effort, but rather of the need for many systems to come together, and for there to be enough time for officers to reorganize themselves from traditional to problem-oriented policing.

By all accounts, problem solving in Charlotte still is vested largely in community coordinators, although in some service areas, such as Charlie, an effort is afoot to generalize police responsibility for problem-solving to all operational personnel. As a result of training in CPOP, personnel are beginning to be more responsible for crime and disorder in their respective areas of responsibility. The crime analysis functions of the department are sophisticated and are now becoming more line oriented, and the technology supporting laptops in patrol cars is now coming on line. Laptops were deployed during the summer and early fall of 1998, but the telecommunications linkages and the support of wide and local area networks had yet to be implemented. This left the officers in the field capable of typing reports on their laptops and downloading those reports at service area or district stations; but the system available to them was not yet, by design, capable of more sophisticated functions. Those interviewed in the department thought that this period would be useful for officers to learn to use the laptops and to become more comfortable with them before they were required to use them extensively in their work. The implementation of this project is expected to be completed by the summer of 1999.

Adoption of Community-Oriented Policing Management Styles

The Charlotte-Mecklenburg Police Department is making the transition from traditional to community- and problem-oriented policing. As previously noted, the department has invested in many of the systems and programs associated with CPOP and has begun to develop a management system that reflects a decentralized and results-oriented style of management. But the department is still struggling with its merger, its change of location to a new station, the growth in the area, and a wide array of internal changes and interventions that are associated with moving the department closer to CPOP. As a result, the management of the department still struggles with the content and process of CPOP. The chief and certainly several of the command personnel have bought into this program, although it is not clear how far reaching that buy-in is with respect to other command personnel and downward through the ranks of the department.

2.4 Community-Oriented Policing Training and Assessment

Beat Officer Training

The department has quite an elaborate training agenda that is heavily invested in CPOP. The Charlotte-Mecklenburg Police Training Academy is located on a 100-acre campus in southwest Charlotte. The training academy houses recruit and in-service training for the department. Currently, basic law enforcement training involves 675 hours of instruction over an 18-week course of study. In addition to traditional police courses, the academy provides extensive training on effective communications, diversity, problem-oriented policing, and computer proficiency. With the introduction of laptops to the department, personnel are required to pass computer proficiency tests to assure that they know how to use the computers they are issued.

In-service training is also required at 40 hours annually. The topics used in the Advanced Law Enforcement Readiness Training (ALERT) include effective communication, problem solving, and team building, as well as tactical and legal coursework. The department also offers a wide range of courses supporting its technology interventions. These courses include Introduction to Personal Computers, Internet Usage, Microsoft Windows NT, WordPerfect, Microsoft Office Suite, Outlook 98, and Offense Reporting Systems. Through its Technology Lab, the department teaches recruits, officers, and civilian personnel computer operating systems and commercial applications designed for the department. Much of this training is in preparation for the implementation of a system of portable telecommunications through the use of laptops in patrol cars. In addition, the department has gone to considerable effort to create training manuals and have them copyrighted. The manuals are very professional and attest to the large amount of thought and program development going into the preparation of officers.

Supervisory Training

Supervisory training has followed a pattern similar to the other types of training in the department. All supervisors have received CPOP training as well as training in new

management techniques and the use of technology. The department has spent considerable resources sending supervisory and management personnel to outside training programs and has created a Charlotte-Mecklenburg Police Institute to bring training to the Charlotte area at minimal cost. The Institute was founded in 1995 and is built as a regional partnership to offer nationally recognized training.

In addition to local and regional training, the chief is well integrated into the larger police development and professional movement and regularly sends supervisory and command personnel to national programs. The department personnel are also sought after to participate in programs, often as instructors.

Community- and problem-oriented policing are clearly emphasized in all of the department's external presentations, as well as in the internal style to which personnel should be directing their efforts and behavior. The department is moving along several paths simultaneously, including decentralizing operations, increasing internal analytic and communications functions, re-engineering basic systems, building intelligence systems to support CPOP, and increasing interaction with other agencies and with the community at large. These efforts place the Charlotte-Mecklenburg Police Department in a powerful position with regard to changing the style of policing and its services to the area. As the department is in transition, many of these functions and efforts will need to be completed.

3 Information Systems

In the Charlotte-Mecklenburg Police Department, organizational leadership is primarily driving technology. Prior to the planning and implementation process associated with technology, the department had not invested a great deal in technology information systems or other apparatus that would facilitate the style of CPOP toward which it is now turning. In fact, the past systems were merely maintenance systems, largely in support of a very traditional style of policing. Much of what was there was "home grown," and the applications available were not very sophisticated. These applications were also not integrated across the department.

In 1994 the department published its Community Safety Plan (1994), a document that outlined public safety needs in the city and the county. This document indicated that violent crime was rising, youth crime was also becoming more complicated and significant, and the area had a high level of drug and alcohol abuse that was associated with increased crime. The Community Safety Plan outlined a course of action involving short-term responses to crime, including a violent crime task force, creating a juvenile crime unit, expanding street-level drug interdiction, and creating and deploying domestic violence teams. In addition, the Community Safety Plan set the stage for CPOP. As such, this plan was a type of blueprint that addressed immediate operational realignment as well as longer-term organizational reform, including information system reform.

The central goals for the department as outlined in the Community Safety Plan were to:

1. Decrease the rate of crime and increase the perception of community safety through neighborhood based service.
2. Decrease the rate of violent crime.
3. Decrease the rate of crime committed by youth.
4. Decrease the rate of substance abuse-related crime.
5. Decrease the rate of repeat offender crime.
6. Ensure the most efficient utilization of public resources in combating crime.
7. Develop and conduct an annual evaluation process (1994).

These goals undergirded the subsequent planning for technology refinement in the department. Specifically, the Plan's explanation of goal #6 included several references to improved technology. Three action plans included in this goal cited the need to:

1. Conduct a police information study and develop a comprehensive information management system (action plan 14).
2. Support a statewide integrated Criminal Justice Information System (action plan 15).
3. Support locally the development of the Mecklenburg County integrated criminal justice information system.

As part of his reform strategy, the chief enlisted the support of two faculty members from the University of North Carolina-Charlotte (UNCC). This university assistance was focused on the planning and research needs of the department and was largely responsible for the Community Safety Plan, thereby setting the stage for further refinement in planning throughout the department.

The first faculty member was brought in to reorganize and improve the Crime Analysis and Planning Units. These units were eventually combined into the Research, Planning and Analysis Bureau. This faculty member made a significant contribution by establishing GIS mapping as his first initiative and is now the director of the bureau.

The second faculty person was brought in at a later time as the information and technology consultant. The technology consultant, an information and technology specialist at UNCC, was encouraged to work with the department in assessing technology needs and creating a technology plan. The technology consultant has been with the department for more than three years. Last year she worked in the department full time. She is currently under contract through the end of May 2000.

While the Community Safety Plan set the stage for reform in the department, a subsequent report, the Master Information System Plan published in 1996, has set the stage for technology development in Charlotte-Mecklenburg County. This plan was developed by the technology consultant as an assessment of current systems, applications, and needs and as a blueprint for the development of a technology trajectory in the department.

The Master Information System Plan (hereafter referred to as the System Plan) served several functions in the department to bring technology issues to the forefront. Each

of these functions can be seen as contributing to an ongoing and systematic internal discussion about the department's path to CPOP as well as technology development in support of that path.

First, the expertise of this outside consultant is not likely to have been available within the department, since most of the staff were associated with the older department, had been primarily trained in older technologies, and were often swamped with maintaining the older systems in the department. Given the technology consultant's expertise, for the first time the department was able to systematically evaluate its technology, and at a significantly lower cost than would have been the case had an outside consulting firm been brought in to conduct this analysis. Moreover, as a continuation of the planning and strategic management of the department, the System Plan helped to continue the planning path already developed; at the same time, it was seen as an internally derived assessment of the department's needs, capabilities, and desires regarding technology development. This sense of ownership, of course, improved the chances of the report being accepted and acted upon internally.

Second, given the methodology used by the technology consultant in conducting the assessment of users (she used focus groups, key person interviews, and survey instruments), the department was able to begin to draw users into the discussion of technology. As a result, two ongoing ad hoc groups, the Records Management Committee and the Laptop Committee, became systematically involved in the definition, design, implementation, and ultimately the assessment of the technology to be introduced in the department. In addition, several spin-off efforts (or, more appropriately, allied efforts) have also occurred as a result of this initial, assessment-of-users process. For example, this effort pointed to the need to better analyze and "map" the business processes of the department. Working with the TRW consulting firm, a reengineering process was implemented in the department that examined all of the department's functions and processes. Over several months a rather large committee (upwards of 30 people) met, often for a full week at a time, to discuss and review departmental processes. This resulted in the creation of a Process Mapping Unit in the Charlotte-Mecklenburg Police Department, which is now completing a publication mapping out all of the department's processes. In many regards this has had the effect of infusing an analytic perspective within the department, which, perhaps, was not there in the past.

Third, the System Plan served as a means for the department to significantly upgrade its telecommunications and computing (information management and analysis) functions and to build a path that could be pursued within the department to achieve these goals. It is significant that the technology consultant designed and is now overseeing the implementation of the system. All too often such efforts are confronted with the disjuncture between those who design and build the system (typically those outside of the department) and those who must implement and ultimately work with the system on a continuing basis. The arrangement in Charlotte-Mecklenburg appears to create a more stable and continuous basis for systems design and implementation.

The System Plan developed in Charlotte-Mecklenburg County is built on a four-stage planning model outlined in Turban, McLean, and Wetherbe's Information Technology

for Management (John Wiley, New York, 1996). The model begins with a strategic analysis followed by assessments of organizational information resource requirements. From these materials a resource allocation plan is developed and specific project plans are then derived.

The result of this System Plan is the design and implementation of an eightfold strategy to increase and enhance technology in support of CPOP in Charlotte-Mecklenburg County. This eightfold strategy includes the following:

1. Design, acquisition, and implementation of a new CAD system for the department.
2. Expanded training for departmental members for the use of technology in furtherance of both decentralized management and tactical community- and problem-oriented policing.
3. Acquisition and deployment of 1,200 laptops, one to each police officer in the department, which are seen as the platform for officer decision making and problem solving.
4. Creation of both a LAN and a WAN system to integrate management and record keeping within the department.
5. Installation of modems in patrol vehicles to accommodate the transmission of data/information directly from cars to the central computing facilities in the department, thereby eliminating the approach of downloading data from disks often used by other departments.
6. Acquisition and implementation of a mobile data communication system, a significant portion of which will be overseen and managed as an out-source project.
7. Design and field testing of application programs, including KB-COPS and computer-aided dispatch (CAD), in furtherance of the laptop and mobile communications components of the plan.
8. Creation of a support system necessary to maintain and support the other components of this strategy.

This is a very ambitious undertaking in the department, one that has affected the organization of information and computer services in the department, and one that is likely to have a significant impact on the department in the future. At present, much of the effort has been directed to planning and acquiring contracts with vendors. In the months to come, the results of these efforts are to be rolled out by the department and overseen by an expanding technology component within the department.

The Community Safety Plan and the System Plan are publicly disseminated documents that outline technology as having a significant role in the Charlotte-Mecklenburg Police Department. As previously indicated, the Community Safety Plan had several action plans specifically focused on enhancing technology. The System Plan is completely focused on these activities. Moreover, the department's Mission Statement includes the idea that the department strives to "prevent the next crime" (implying an analytic focus), and indicates that communications and problem solving are central features of its organizational efforts to make Charlotte a safer place.

Since the department has initiated its efforts with outside (UNCC) support, it is clear that it does not believe that it has the internal capability at present to rely too heavily on internal resources alone. As mentioned previously, personnel in the Computer Technology Services (CTS) unit have programming and some systems design experience (see Section 3.1, about staffing), and the department is seeking to build its in-house capability.

Where the department has been willing to take risks is in having an internal technology consultant provide to the department's leadership (mostly the chief) a wider view of technology development and of the external marketplace that might assist the department in its quest for an improved information and communications system. The risks that the department has taken here are indeed interesting and at times run contrary to where others have gone. Two examples are highly relevant.

The first illustration of the department's risk-taking capacity is related to its laptop computer program. Initially, as in many departments, the thought of moving to laptops was accompanied by a discussion of how to make them rugged enough to survive field implementation. After considerable review and discussion, it was determined that the department would forego the process of making the computers rugged (a considerable cost in its own right) and opt instead for buying traditional laptop computers. The thinking behind this move was associated with three issues. First, it was indicated that the cost of making the computers rugged was itself expensive and would ultimately limit the growth path of technology (i.e., buying laptops that would conform to the rugged encasements). Second, the process of making the laptops rugged apparently has the negative byproduct of limiting air circulation around the laptop, and the new processors now available (Pentium II) produce heat that limits the life of the chip and can result in a faster rate of laptop failure. Third, the cost of making the laptops rugged would reduce considerably the number purchased; this, in turn, would require that laptops be assigned to cars and not to people. Such an assignment would result in no one being responsible for the laptop (they could blame the prior user) and, more importantly, the learning curve and acceptance of the new technology would be reduced. All of these factors led to a decision to give everyone (patrol personnel) a laptop, thereby increasing accountability and perhaps the sense of ownership on the part of police officers for their use and for the connection between problem solving and the data they will eventually be able to obtain from these information systems.

A second illustration of the risk taking of the department in the platform it is building in the telecommunications area is its decision to out-source a significant portion of its telecommunications process. Here the following logic was applied. First, while many departments seek to control telecommunications systems (particularly data transmission), they do so at considerable cost, while at the same time locking themselves into a system (and system maintenance costs) that greatly restricts their ability to grow along with developments in the telecommunications industry. Instead of pursuing this path, the Charlotte-Mecklenburg Police Department decided to out-source its telecommunications (data transmission only) by establishing a contract with Bell Atlantic Mobile for the creation and maintenance of the telecommunications/data transmission system. The department will maintain control over the voice telecom-

munications system. This will result in the placement of a mobile data transmission/receipt modem in each vehicle and the oversight of this system by Bell Atlantic Mobile. It is anticipated that such an arrangement will create a more responsive and more flexible telecommunications system in the long term. Moreover, since the expense for this effort will be a recurring line item in the department's budget, it is anticipated that the department will have created the capacity for continual upgrading of the system as telecommunications technology changes in the future.

The Charlotte-Mecklenburg Police Department is in the process of routinizing its training for all departmental personnel when it comes to the new system. The general model the department is using is to train a cadre of persons who would then be sent into the service areas and districts to work locally training police and managerial personnel. This will need follow-up to fill in the blanks. What is important is that training is a system that the department has included in its implementation plan.

Laptop support has been out-sourced, and the department is in the process of having a vendor establish a repair, swapping, and troubleshooting office in the Charlotte-Mecklenburg Police Department headquarters building. This laptop service center will be the prime point of contact in support of the laptop program, primarily the hardware aspects of that program. Support for the data transmission component of the telecommunications system will come from Bell Atlantic Mobile, while the CAD 911 telecommunication supports will be internal, connected with the radio telecommunications functions within the department.

The department has also created KB-COPS, which will link the department's RMS with crime analysis and mapping systems, while at the same time developing support for CPOP activities. CTS will oversee the maintenance of this system.

The vision for the department's technology plan is far reaching. In addition to the hardware systems that are planned or in the process of being acquired, the department has developed a significant internal analytic effort to better understand its business processes, reengineer them, and connect these reengineered processes with a more fully elaborated information and decisional system. The KB-COPS envisioned for the department includes a new CAD system capable of providing quicker and more accurate information on people, vehicles, and places, as well as being the repository (linked with RMS) for offense reports, field interview information, arrest information, case investigations, and property and evidence information.

Much of the hardware and software design for the Charlotte-Mecklenburg Police Department originated through the System Plan. The System Plan engaged the department in a rather thorough discussion of its information needs and current capabilities, while identifying a trajectory for technology development for the years to come. The System Plan involved all of the stakeholders in the process, identified barriers to obtaining needed information, and established the data elements necessary to create a system capable of supporting CPOP in Charlotte.

The process vision and subsequent groundwork and infrastructure developed by the department to implement the major information technology (IT) changes has been

significant. The technology consultant worked vigorously with end users in focus groups to identify information needs to support CPOP. Significant funding to support these information needs came from the city, reinforcing local commitment. The chief emphasized a team commitment to carry out new policies and projects, not relying on one or two senior-level staff to complete them.

It should be noted that IT projects frequently fail because of the amount of risk and planning required to make them successful. The department chose to manage their risk through careful development of Requests for Proposals (RFP) and vendor contracts by using city attorneys to draft these documents. Another important component in the success of this process is the extensive training provided to end users. The department dedicated staff to develop and provide five phases of training for 1,400 users.

The process has touched many of the components of the Charlotte-Mecklenburg Police Department and is seen as well connected to internal leadership and decision making.

3.1 Information Technology Staffing and Responsibility

The technology unit in the department was minimally staffed four years ago, primarily with computer programmers and systems engineers, and was located as a support service within the administrative units of the department. Today, the unit enjoys higher visibility, working closely with the administrative aide to the deputy chief over the Administration and Support Division. The technology consultant plays a large role in the unit and works very closely with the administrative aide.

CTS is the central unit overseeing technology development and implementation in the department. This unit is essentially responsible for systems design and maintenance, as well as for the development of applications. In addition to this unit, the Communications Bureau oversees the radio and 911 response, but is actively linked to the computer unit. A planning and research function that houses crime analysis, while not directly attached to the computer unit, is also an active player in this process. The CTS team has a diversity of skills and expertise, which has been crucial to the unit's success.

A final organizational design has yet to emerge. Much of this effort is being coordinated through the computer unit; as functions become self-sufficient, there is every reason to believe that they will be made autonomous, consistent with the department's decentralization and empowerment emphasis.

Before 1994, the department had not developed very sophisticated technology in support of its objectives, and planning was weak; therefore, there was not much to overcome in the transition to newer systems. That is to say, because of the relatively low investment in technical systems in the department prior to 1994, the plan is simply to sweep out the old technology and replace it. Given the disruption that the merger likely produced, there was not, at least among the people we interviewed, anyone who appeared wedded to past systems of operations. This is a significantly positive situa-

tion for the department, as it can change things without the problems of overcoming significant resistance from those who feel a need to cling to previous systems.

Prior to this effort, there were five to six people in the department charged with systems design and maintenance. Each was trained in mainframe applications, and there was little, if any, use of personal computer (PC) technology. While these people have been retained in the transition to a client-server environment, the expansion of staffing has been focused on PC systems engineers and applications programmers who can work flexibly in such an environment. CTS uses a matrix structure emphasizing project teams. This strategy is used to respond to the rapid technological changes in the department.

Most of the personnel in the CTS are civilians trained as applications or systems engineers. There are approximately 20 people in this unit, and it is anticipated that the unit will grow to about 30 people. Entry criteria require these people to be technically trained, and the department is now investing resources in skills updating and continuous training for these personnel.

Much of the current effort of CTS is in tracking vendors and purchase orders from the city and subsequently trouble shooting the vendors' design and/or implementation problems. In addition, there are several programmers and engineers who are now integrating a significant amount of new equipment that constituted the new technology environment in the department.

Perhaps one of the biggest problems confronting this process in Charlotte is the continuation of these efforts after the technology consultant returns to the university. She indicated that this is her third year with the department and that she is predisposed to return to the university, as it has now created a College of Information Technology that she will have a role in developing. The department has, however, hired a new CTS manager who has a master's degree in computer information systems and is working toward a Ph.D. in strategic management. The department is confident that the new manager's transition will be smooth.

3.2 Historical Review of Department Information Systems

This description of the information system in the Charlotte-Mecklenburg Police Department is outlined in terms of both the historic system (taken from the System Plan) and recommendations to upgrade that system. The majority of the database systems in the department resided on the city/county IBM 3090 mainframe system. The city and county shared the system, each running its own partition. CICS/MVS was used to oversee communications between terminal users and databases. City police functions used COBOL as the primary language for programming, with DATACOM DB as the database platform. The county used COBOL and VSAM, and in some cases DB2. The police department (Charlotte) also had its own mainframe (ES 9000), used primarily for dispatch.

The department has about 60 terminals linked to the mainframe and they were used only for word processing applications. These terminals are being phased out by July

1999 and replaced with PCs. Additional mainframe terminals used to access the CAD system and other files not yet moved to the client-server environment are being replaced by terminal emulation capability on the PCs.

The department used a Motorola Radio Network for data transmission to the mobile data terminals (MDTs). The department had approximately 275 MDTs, allowing officers to communicate with dispatchers and to access DCI and department of motor vehicles (DMV) databases. The MDTs also allowed officers to access warrant databases and to communicate between cars.

In terms of software, stand-alone versions of WordPerfect 6.1 and Microsoft Office were available on the 225 or so microcomputers scattered throughout the department. The department had limited connection with the city LAN and with e-mail services. The GIS was built around ArcInfo, which is PC based, and provided access to the city/county corporate GIS databases on Sun Solaris (UNIX) workstations and servers. Internal systems in the Charlotte-Mecklenburg Police Department included accident reporting, animal control, automated fingerprinting, case management, citations and warning tickets, and some crime analysis programming. In addition, a CAD and 911 system was operational. Several other applications are listed and evaluated in the System Plan. All of these systems are in the process of being upgraded, discarded, or redesigned in accordance with the System Plan's recommendations.

3.3 Information Systems Currently Used

The department is building its new system around several components, including an Enterprise 4000 that is a Unix server, Sun Solaris 2.6 PDB Cluster with 1 gigabyte (GB) memory and 75 GB drive, linked to Compaq Proliant 6000 1 GB RAM system, and to 100 megabyte (MB) ATM over Sonet. These systems will be linked via Ethernet to Pentium MMX PCs. Radio telecommunication will link radio and data transfer to cars equipped with Digital P 166 80 MB RAM, and 2.1 GB laptops. Fiber optic communications will also link area and district stations with from 10 to 100 MB capacities for local analysis and downloading. Much of the building of this architecture is already under way. Interestingly, the department was able to piggyback its fiber optic cable installation with ongoing work in the banking system, thereby defraying considerable costs and speeding up the installation of the fiber optics.

Currently, information has difficulty flowing throughout the organization. Many of the persons interviewed suggested that both the strength and the weakness of the Charlotte-Mecklenburg Police Department organizational structure lies in its decentralization. That is to say, given the depth of decentralization in the department, information communication has become difficult. At the managerial level, it was suggested, there is a problem in getting notifications of organizational changes and the like, as well as in communications with the central office. It is anticipated in the organization that these problems will dissipate once the internal e-mail system is implemented.

As indicated, the decentralized and at times idiosyncratic nature of command decision making accounts for problems in communications and information use. However, it

is anticipated that the technology will provide for some consistency in commands owing to the format and display of the reporting systems and the relative ease of communicating via e-mail.

End users have had considerable input into the design of information collection as well as the entire technological platform planned for Charlotte. They have been surveyed, have participated in focus groups, and are members of internal committees overseeing both design and implementation issues.

3.4 Information Systems Related to Professional-Era Policing

Operations Information Systems

At the operational level, the historic MDT system still provided enough information for operational decision making, although in one ride-along it was suggested that the turnaround time for MDT response to a query was often long. Again, however, it is anticipated that once the laptops are deployed many of these problems will go away. As the laptops were just being introduced during our last visit, their impact and use is as yet undetermined. Of the officers interviewed, some said they used them but were quick to admit that many of the laptops did not leave the car or get used by other officers. As on-line reporting becomes mandated this circumstance should change.

Most of the technology applications are now being coordinated through the computer unit. In the past, applications have grown up in isolation from one another as they were likely developed locally and in a stand-alone fashion. At present the emphasis in technology development and systems applications is focused on the patrol functions of the department. In one interview it was suggested that the detectives were crying for help but that the organization had made a decision to focus on patrol first, and, given the complexity of this system and of its implementation, the detectives and other units in the organization would have to wait.

Command and Control Systems

At present these command and control systems are fledgling in the department. The introduction of a new RMS was seen as a way to improve the information necessary for command and control. At the same time, the department has been examining differing uses of the CAD system to improve its fit into the RMS. Typically, the RMS is fit to the CAD, and as pointed out in several discussions, this tends to severely limit the use of data from the CAD system in the RMS, and indeed in command-and-control decision making.

Management Information Systems

Presently the system in Charlotte, given its transition from the planning to the implementation stage, remains centralized despite the decentralized nature of the organization. This is likely to be the case for some time as the system is tested and refined. In addition to this process, there are several other ongoing efforts that have created overlapping committee memberships that include rank-and-file police officers as well as command personnel. Several of these committees have interests in aspects of the technology program and its implementation. Finally, a process mapping group has also been formed in the department to map out all business

processes and to make recommendations where appropriate. This group is also likely to overlap in interest in and oversight of the technology program in Charlotte-Mecklenburg Police Department. In short, many people are watching and assisting this process.

3.5 Information Systems Related to Community-Oriented Policing

Geographic Information Systems (GIS)

As previously discussed, the department is heavily invested in GIS and its varied applications. The GIS Analysis Unit is becoming more prominent in the operational decision making of the department, and there are several efforts afoot to model "hot spot" and other geographic referent information. There is also a linkage to city planning functions such that information on land use, water bills (showing ownership of buildings), and social data are capable of being integrated with crime and disorder data. In fact, the city has gone to considerable effort to define neighborhoods and to identify the condition of these communities on a scale that ranges from stable to distressed. Such information is now being used by police commanders in the field to identify community needs and to design programs to address those needs.

Problem-Solving Information Systems

As indicated, both the KB-COPS and the FALCON systems are direct evidence of a sophisticated approach to building "smart" information systems in support of problem solving. Some of these systems are now being created locally to capture information on local problem-solving experiences. These systems will take time to refine and develop in Charlotte to see if they do indeed impact how the police use information to solve local problems. What is clear is that these systems are all pointed in the same general direction – to make information quickly available to those in the field so that they can solve community crime and disorder problems.

External Information Systems

Much of what has occurred in Charlotte, in terms of information systems, has occurred in the Charlotte-Mecklenburg Police Department. It was suggested that the department enjoys considerable latitude in the definition of its technology needs and has the support of the City Manager. As previously noted, it was suggested that the department has always enjoyed good relationships with outside agencies in both the City of Charlotte and the county. This was described as part of the local political and social culture.

As part of its planning process and included as an action plan in the Community Safety Plan of 1994, the department has been working with the city and county to create and/or strengthen a countywide criminal justice information system. In addition, the department currently has linkages with tax and water department records as well as with the city/county GIS.

In funding this program, the department has been able to patch together resources from several sources. The department is spending upwards of $18 million on this effort. Resources for this effort come from the COPS MORE program, other Federal programs (such as an NIJ grant), and from local resources, as well as from internal departmental budgets. In addition, the department has established a local foundation to support training and other departmental initiatives in an effort to build a funding stream for these programs independent of the city and county. All of these activities require building partnerships.

In one interview it was suggested that the city manager was a dominant force in shaping the department's push for CPOP and that other city department heads were directed to participate in these partnerships, although it was quickly added that such relationships were good from the start. Based on our analysis in Charlotte, this aspect of partnership formation and maintenance should be pursued.

3.6 Relationships and Experience with Vendors

The department is tied to the city's procurement process, which was not fully explored in these visits. What emerged, however, is something of considerable impact for police agencies building and/or reengineering their technical systems.

Historically, and perhaps typically, police agencies are at the mercy of vendors in the acquisition and implementation of technology. In our many visits to police agencies throughout the country, several noted that they are currently in some form of litigation regarding a technical system failure. This occurs for many reasons.

First, the departments and their city agencies often lack the real expertise to determine system requirements and to hold the feet of vendors to the fire of a schedule and time frame for effective implementation. All too often these agencies assume good faith on the part of vendors, which contributes to their own demise.

Second, police agencies are often ignorant of the market issues that confront technology companies. The rapid growth of this industry has produced many internal industry problems that play themselves out in the meeting of contractual obligations. Most vendors do not want to be tied to contracts that are too results-oriented. Rather, they want "time and materials" contracts so that they can learn along the way. The rapid turnover in personnel in this industry also affects project timeliness and completion. As previously indicated, the technology consultant suggested that the system failure rate nationally for these types of technology programs (in all fields) ran into the 70 percent level, with an annual failure cost estimated at $80 billion plus. If this is anywhere near the case, then all levels of government – as well as the private marketplace – are struggling with the same issue of how to build a system and hold the contractor to the outcomes in a timely and efficient manner.

The department has approached this problem in a unique way. First they hired the consultant and others from UNCC to be their internal consultants and to take a strong role in the process of shaping technology development as well as the RFPs flowing from these efforts. The city hired an attorney who is assigned to the city attorney's office to work solely on technology contracts. The attorney enlists the assistance of

outside counsel on an as-needed basis. Based on this approach, the department believes that it has considerable leverage in getting vendors to comply. By creating this process, the city hopes to avoid potential litigation with vendors by preparing detailed contracts to prevent misunderstandings.

4 Analysis Methods Used

The Charlotte-Mecklenburg Police Department uses several methods of information collection and analysis. Some of these methods and modes of analysis are related to the department's previous history of traditional policing. Others are now emerging as part of the department's move toward CPOP. Because these processes are unfolding at present, certain assessments are inferred from current plans rather than observed directly in field or administrative settings.

4.1 Professional-Era Analysis Methods

Crime Analysis

Crime analysis in the department is being refined on a continual basis. Over the past few years the department has put much time and effort into crime measurement and into the systems that can analyze and display crime and disorder information in a more systematic fashion. In addition to the electronic pin maps that are ubiquitous in the department, there is a serious effort to use this information as a means of defining problems and assessing impacts. The Grier Heights Project illustrates this approach.

Moreover, in each of the areas we visited there was considerable evidence that crime analysis is now making its way out of the central organization into the field. What is not clear at present are the ways in which this information is being used to actually change tactics or strategies. Since much of the technology and analytic capability is new to the department, it may take some time for these systems to take root in field practice. Nonetheless, there is considerable evidence that both the discussion within the department and the way it presents itself to the outside world emphasizes crime analysis as a primary means of understanding crime and then adjusting practices to affect crime patterns.

Operations Analysis

Operations analysis in the department is not clearly specified at present. There are meetings to examine the current and future deployment patterns of the department and there is an ongoing effort to map and then reengineer basic operational systems within the department. What is clear is that operations analysis is in place and often involves people from throughout the department. The final products of this operational analysis are expected to help streamline operations and find ways to improve efficiency and effectiveness.

The chief stresses knowing what is going on, and his administrative deputy chief has spent considerable time in planning out a better operational system, including ongo-

ing operational analysis. What is required now is time for this system to be implemented and assessed thoroughly. The Safety Plan was operationally focused and pointed the organization toward clearer operational and strategic analysis.

Intelligence Analysis

Although the department operates several intelligence functions, at the time of our visits and in the documents we received it does not appear that these systems have yet been tied to the overall improvements to internal information and analytic systems. One exception to this comment is the FALCON system. This system affords the opportunity to set the conditions one is searching for and then have the computer generate a "call" to that inquiry once those conditions are reached. To the extent that this represents an intelligence function, the system described might be used for many information and intelligence gathering efforts. In addition, the department has been in the lead in building a regional criminal justice information system and linking these systems to the State criminal history information systems. Once these systems are connected, it is clear that this access and information might be used to support intelligence operations and analysis.

Administrative Analysis

The department has an ongoing program to examine administrative functions systemwide. Much of the development in the department to date has carefully examined the department's administrative processes and changed those structures to support a more decentralized style of policing. Moreover, the department has gone to considerable lengths to define new functions and roles for nearly every position in the department so that all efforts contribute to the CPOP style of policing that they are implementing. This form of administrative assessment has now crept into policymaking in that levels of authority and responsibility are being made congruent with the changing organizational structure. All of this has been formalized and created through overlapping committees, to help increase buy-in and to increase the likelihood of adoption of these new roles and functions throughout the department.

4.2 Community-Oriented Policing Analysis Methods

Community Analysis

The department has considerable information at its disposal relative to community dynamics and needs. The city collects information on defined communities and then classifies those communities on a continuum ranging from stable to distressed. The city expects that city agencies will work to address, within defined categories, those conditions that detract from community stability. In addition, the department links land use information with social data to define neighborhoods and community problems. This information is now being linked to information on crime and disorder. Much of this effort is new to the police department, and it is not clear how the infor-

mation is being used at the tactical level. In meetings with those in the field (commanders), it was clear that they knew some of the terminology, but it was not clear if they were using the information in any systematic fashion.

Problem Analysis

This area of analysis is something the department is approaching on several levels, some of which have already been discussed. At the strategic level, the KB-COPS and the FALCON programs are problem-solving approaches in the use of information and analysis to identify problems. Community coordinators are proactive in problem analysis, and in some service areas there are ongoing attempts to routinize information on problem solving and its effects. Much of this effort is now beginning to become visible in the department; but it will take some time to take hold as the mode of police operations in the Charlotte department. Nonetheless, this is a very well thought out effort and is informationally and analytically driven.

Future Initiatives Related to Analysis Methods

Future initiatives have yet to take shape in the department. With all the changes it has made, the department will likely need some time to "settle down" before determining future analytic needs. It is clear, however, that the department has a philosophy of continually pursuing resources and activities that emphasize new modes of analysis. The department's linkage with ESRI and others is a good illustration of this philosophy in practice.

5 Use of Information

The ISTEP conceptual framework identifies seven information domains that are critical to the successful implementation of community policing. The seven domains are community interface, inter-organizational linkages, work-group facilitation, environmental scanning, problem orientation, area accountability, and strategic management. In each of these domains, information technology can, if properly applied, greatly enhance the effectiveness of community policing.

It should be kept in mind that much of the effort in the Charlotte-Mecklenburg Police Department up to the time of our observations involved moving a highly detailed and intricate plan off the drawing board and making it operational. What is presented below is in part based on an assessment of the likely use of information and of the current strengths and/or weaknesses of available types of information. It is important to remember that the current state of the department is rather dynamic.

5.1 Community Interface

As indicated, community information in Charlotte appears to be available in the form of both social and physical data, as well as data on all types of economic and related issues. The websites for both the police department and the city contain quite a bit of

this information, and it is clear that the department and the city value having the information to describe the city and to use as a means of assessing communities. In the Grier Heights Project, this data was integrated as a descriptive analysis of community characteristics and crime hot spots.
The department has also conducted surveys in the community examining how the community perceives crime, safety, and the police department. It is not clear that this information will be an ongoing data element in the department's program, although it is clear that the chief values community information.

It is also not clear how this information is used in either the service areas or the districts. In the areas we visited, however, there was considerable discussion about the characteristics of the community that appeared to be informed by prior analysis.

5.2 Inter-Organizational Linkages

Information concerning inter-organizational linkages appears the least available of all the information sets that the department uses. We interviewed systems staff working in the city who are charged with building linkages for more facile cross-department data. However, these efforts are quite new and will likely take considerable time to develop. What is encouraging is that the discussion about cross-agency information needs is going on in Charlotte; and given the direction the department has taken, such discussions are likely to prove fruitful in the future. There are linkages between the police department and other justice system agencies, but most of these are typically linkages of the past. The department has set a goal to help build a regional crime information system and to better link this system with that of the State.

5.3 Work-Group Facilitation

We saw little evidence of work-group facilitation during our visits. Linkages among work groups are primarily managed in the traditional chain-of-command manner, even though much of the management and information systems planning has been team centered. The investigative function has not been included well in this process, at least initially.

5.4 Environmental Scanning

It is clear that the problem-oriented policing efforts in Charlotte have resulted in considerable environmental scanning; that is, the problem focus has led to more information about communities, crime dynamics, and how problems are getting resolved (assuming they are). Data sets are being created and linked that will be proactive in identifying early problem sets; an example is the FALCON system.

While such information is becoming more available in Charlotte, it is not clear that it has permeated either the tactical management or tactical operations activities in the department. When such information exists, it is not clear how it is being used to create tactics and/or strategies to address discrete problems. The language and informa-

tion are there, but the use is not yet systematic in the Charlotte-Mecklenburg Police Department.

5.5 Problem Orientation

Once fully operational, the KB-COPS system as well as the locally developed problem-solving programs will be useful information systems within the department. These are all in the developmental stage at present and will take considerable time to become operational. The local programs are likely to emerge first, and in fact the department is encouraging service areas to develop their own approach to capturing information on problem solving. It is anticipated that eventually the most successful of the programs will migrate across the department and perhaps be linked with more centralized information systems such as the new RMS.

What is perhaps most critical about Charlotte is that problem solving appears to be an emerging centerpiece of the practice of policing. Nearly all the information systems planned or in place appear to be moving toward supporting problem-solving efforts in the field.

5.6 Area Accountability

The language of area accountability is in place in Charlotte. What is not clear are the methods for assuring area accountability. Currently, rather traditional sources of information are used for that purpose, including reported crimes and arrests. In decentralizing the department, there is a tendency to allow the local areas to determine much of their own practice and procedure. This has led to some "noise" in the police department as differing perspectives on accountability are aired in command discussions. Nonetheless, the information systems being put into place can only improve access to information about how well an area or district is doing. Some of these changes will require the support of the emerging culture of the department, with an emphasis on both professional policing and responsiveness to the community.

5.7 Strategic Management

By all accounts, strategic management is perhaps the best developed of all the seven information domains in the Charlotte-Mecklenburg Police Department. The department has invested the past five years in self-examination and in monitoring its environment and charting its future. The department has also published several plans outlining its needs and the direction it is taking into the future. Internal reengineering efforts have produced considerable information on how the work of the department is conducted, and changes in these practices are currently under way.

5.8 Future Plans Related to Information Use

The efforts to date have yet to be fully realized. It is unclear what path the department will take after it assesses how successful it was in implementing all of the organizational, operational, and information systems changes described in this report.

6 Summary

6.1 Overall Assessment of Information Technology

The Charlotte-Mecklenburg Police Department is deeply involved in implementation of both IT development and CPOP. As a result, the site represents an ongoing story worthy of monitoring and continued assessment. They have an ambitious plan and have taken some very real risks in deciding to use technologies and/or systems that are not typical of police agencies (such as the outsourcing of telecommunication transmission to an outside vendor). They also have worked through many problems in making the organization adjust to technology, and technology to the organization.

At the same time, the organization has been the subject of major systems changes, including those associated with service delivery. This department has been in a state of rapid and continual change for about four years. Thus the department may be atypical in terms of the trends in other departments, but it is likely to have experienced many, if not most, of the decisional and operational implementation problems that IT and COP/POP present to a fairly large organization.

6.2 Charlotte-Mecklenburg Police Department's Best Practices

This department represents many best practices with respect to both process and product. On the process side, the systematic planning and development efforts, coupled with the internal reengineering efforts, are worthy of more systematic inquiry. The linkage with the external university, the consultant relationship it has created around IT issues, and the impact of this development are important to consider as well. The processes that the department has adopted to ensure vendor compliance with departmental needs are also important to understand.

On the product side, decisions about laptop technology, giving laptops to each patrol officer, the types of support systems that have been developed to link LAN, WAN, and field operations, and the design of a new telecommunications system are all discrete products that have emerged from the Charlotte-Mecklenburg site. Each of these areas is a matter of best practice.

In terms of the seven information needs, the department does a good job in soliciting citizen input, has a reasonable approach to building an infrastructure for problem-solving through KB-COPS and FALCON, and has some linkage with other agencies and their databases (e.g., the Grier Heights Project). These information areas are significant accomplishments for the Charlotte-Mecklenburg Police Department.